

Claims

1. A system for imaging the contents of a container, the system comprising an imager arranged to receive millimetre wave radiation from a reception volume through a receive antenna that itself comprises at least one receiving element, wherein, in use, the container is moving relative to the receive antenna, the reception volume is positioned such that the relative movement causes the reception volume to move through the container; data from the antenna is recorded as the reception volume moves through the container, and an image of the contents of the container is built up from the recorded data.

2. A system as claimed in claim 1 wherein the container is mounted on a vehicle.

3. A system as claimed in claim 1 or claim 2 wherein the imaging system is stationary and the container is moving.

4. A system as claimed in any of the above claims where the speed of the container relative to the receive antenna is measured during at least part of the data recording, and this measurement is used as a parameter when creating the complete image.

5. A system as claimed in any of the above claims where the speed of the container is controlled for the duration of data recording.

6. A system as claimed in any of the above claims wherein the axis of the receive antenna is not perpendicular to the direction of relative movement of the container and receive antenna.

7. A system as claimed in any of the above claims wherein a plurality of receive antennas are used to gather data from a plurality of reception volumes.

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8. A system as claimed in any of the above claims wherein the image may be manipulated to allow views of the container contents from different angles.

9. A system as claimed in claim 8 wherein the manipulation allows the user to view stereoscopic images of the container contents.

10. A system as claimed in any of the above claims wherein each receive antenna comprises a plurality of receiving elements,

11. A system as claimed in claim 10 wherein the plurality of receiving elements are arranged in a substantially linear array.

12. A system as claimed in claim 11 wherein the substantially linear array has a major axis perpendicular to the direction of relative movement between the container and the imaging system.

13. A system as claimed in any of the above claims wherein the received volume is scanned by changing with time the direction of each receive beam pattern.

14. A system as claimed in claim 13 wherein the change in direction is effected by conically scanning the direction of each receive beam pattern.

15. A system as claimed in claims 13 or 14 wherein a focal plane of the reception volume viewed from the receiver antenna comprises an area from which no radiation is received during a complete cycle of the scanning system that is completely surrounded by an area from which radiation is received during the scan.

16. A system as claimed in claims 10 to 15 wherein a second array of receive elements is provided that is displaced from the first array so as to receive energy from a different focal plane from the first array.

17. A system as claimed in any of the above claims wherein the image data is analysed by image recognition software that is pre programmed with images or characteristics of contraband items, such that when a match is found between the image data and at least one of the contraband items an alert is sent to an operator.

18. A method of imaging the contents of a container where the container is moving relative to a receive antenna of the imaging system, characterised by:

arranging an imager to receive millimetre wave radiation from a reception volume through the receive antenna that comprises at least one receiving element;

positioning the reception volume such that the relative movement causes the reception volume to move through the container;

recording data from the imager as the reception volume is moved through the container;

compiling an image of the contents of the container from the data.

19. A method as claimed in claim 18 where the receive antenna is arranged to be stationary, and the container arranged to be moving.

20. A method as claimed in claims 18 or 19 where the speed of the container relative to the receive antenna is measured as the reception volume is inside the container, and this measurement is used as a parameter when creating the complete image.

21. A method as claimed in any of claims 18 to 20 where the speed of the container is controlled for the duration the reception volume is inside the container.

22. A portal incorporating an imaging system as claimed in claims 1-17